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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/566,478

07/25/2006

Shinichi Nagata

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23850 7590 01/16/2007

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EXAMINER

VALONE, THOMAS F

ART UNIT

PAPER NUMBER

2858

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

01/16/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	Application No. 10/566,478	Applicant(s) NAGATA ET AL.	
	Examiner Thomas F. Valone	Art Unit 2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,5-10,12-14 and 17 is/are rejected.
- 7) ☒ Claim(s) 2-4,11,15,16 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 January 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/31/06</u>   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The listing of references in the specification (p. 2-3) is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### ***Specification***

2. The abstract of the disclosure is objected to because

a) The phrase "two holed" in the Abstract, line 2, should be deleted and replaced with - - two single-holed - - instead.

b) The phrase "mid point" in the Abstract, line 3 should be deleted and - - mid-point - - inserted instead.

Correction is required. See MPEP § 608.01(b).

3. The disclosure is objected to because of the following informalities:

a) The phrase "two holed" in the Disclosure, p. 4, par. 11, line 28; p. 5, par. 12, line 16; and p.16, par. 38, line 15 have been deleted and replaced with - - two single-holed - -.

Appropriate correction is required.

***Drawings***

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore,

a) The iris plates arranged vertically on a tube axis must be shown in Fig. 1;

b) The tube axis at mid-points of the waveguide must be shown in Fig. 1, 2, 3, or the feature(s) canceled from the claim(s). No new matter should be entered. The iris plates are arranged horizontally in Fig. 1, in contradiction to the claims 1 and 6, and the disclosure (p. 16, line 15-16).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

5. Claims 1 and 6 are objected to because of the following informalities:
- a) The phrase "two holed" in claims 1 and claim 6, line 2 should be deleted and replaced with - - two single-holed - - instead.
  - b) The phrase "mid points" in claims 1 and 6, line 3 should be deleted and - - mid-points - - inserted instead.
  - c) The phrase "in the direction of" in claims 1 and 6, line 3 is not consistent with the disclosure (p. 16, line 17) and should be changed to - - perpendicular to - - or simply, - - on - - .

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 6, 9, 10 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki (4,297,874) in view of Shimizu (4,030,051).

Sasaki teaches a microwave cavity resonator device or method for measuring moisture content, with a slit in which a specimen is disposed being placed in a manner so as to cross the resonator portion (Fig. 2), with a measuring frequency, used to determine moisture content based on a difference in resonance peak level between the cases when the specimen is not present in the slit and when it is

Art Unit: 2858

present in the slit (col. 3, 30-39). Sasaki further teaches a resonator portion (cavity resonator 11, Fig. 2) since both ends are closed and traveling wave portions (16, 19, Fig. 2).

Sasaki does not teach two single-holed iris plates which are arranged vertically in the direction of a tube axis at mid-points of a wave guide, a portion between the iris plates forming a resonator portion and the outside of each of the iris plates forming traveling wave portions as in claims 1 and 6. Also, Sasaki does not teach the traveling wave portions of the microwave cavity resonator being adjacent to iris plates but at each end of the resonant portion, where his sweep oscillator (17, Fig. 2) and intensity receiver (20, Fig. 2) are connected, as in claim 9.

Shimizu from the same field of endeavor, teaches two single-holed iris plates which are arranged vertically along a tube axis at mid-points of a wave guide, a portion between the iris plates forming a resonator portion and the outside of each of the iris plates forming traveling wave portions (Fig. 1). As to the predetermined range between 1 to 25 GHz, it is inherent to microwaves to operate in this range, because the resonant cavity size is half a wavelength, as suggested by Shimizu (col. 1, line 40).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included Shimizu's iris plate design, which maximizes coupling to the specimen in the center, with a coaxial resonator portion separate from the traveling wave portion, setting a measuring frequency in a range between 1 and 25 GHz, as in claims 1 and 6 as well as to have the traveling wave portions, both sweep oscillator connection and intensity receiver connection, of the microwave cavity

Art Unit: 2858

resonator being adjacent to Shimizu's iris plates, as in claim 9, because they are already at each end of Sasaki's resonant portion, which already includes a traveling wave portion separate from the resonator portion.

As to claims 10 and 17, Sasaki teaches a one-sided flange (12<sub>3</sub>, 13<sub>3</sub>, Fig. 2 and col. 2, line 50) with the coaxial wave guide converter for the oscillator and the receiver (17, 20, Fig. 2) as in claim 10. However, applicant admits that wave guide converters with one-sided flanges are "commercially available" and "easily achieved" (p. 13, line 21).

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki and Shimizu (S-S), in view of Fitsky (4,203,067).

The teachings of S-S are reviewed above.

S-S does not include a consideration for temperature.

Fitsky teaches that frequency selection should be made to minimize the effect of temperature (col. 3, line 60-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a measurement, detection and correction of temperature dependency in the microwave resonator of S-S, for the benefit of resonant frequency measurement accuracy.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki and Shimizu (S-S), in view of Kich (4,677,403).

The teachings of S-S are reviewed above.

Art Unit: 2858

S-S does not include a consideration for small millimeter sized iris openings.

Kich discloses a microwave cavity resonator (comprising an iris 22 which divides a waveguide body into a pair of cavities 12a, 12b. The iris 22 has a 1.57 mm opening.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included an iris opening in the range of 1 – 20 mm, as suggested by Kich, for the benefit of limiting the amplitude of the microwaves.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki and Shimizu (S-S), in view of Nagata (6,496,018).

The teachings of S-S are reviewed above.

S-S does not include a consideration for the TE 101, 102, 103... modes or a maximum valued of the electric field vector.

Nagata from the same field of endeavor teaches a microwave cavity resonator 6 (Fig. 1) for measuring the dielectric constant comprising sample 10 provided in slit 8. The constant is measured with and without the sample being present. Nagata also discloses forming a TE mode as a resonant mode (Fig. 5A).

It would have been obvious to the of ordinary skill in the art at the time the invention was made to have included TE101, 102, 103... modes or a maximum valued of the electric field vector, based on the suggestion of Nagata, for the benefit of exposing the sample to the highest intensity microwave energy.

11. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki and Shimizu (S-S) further in view of Maeno (4,890,054).



Art Unit: 2858

The teachings of S-S are reviewed above.

S-S does not include continuous supply of the specimen to the slit, or the data processing device comprising a storage unit that stores a resonant peak level value for comparison of the presence and absence of the specimen for continuous moisture measurement.

Maeno teaches continuous supply of the specimen to the slit, and the data processing device comprising a storage unit (CPU 18, col. 6, line 20) that stores a resonant peak level value for comparison of the presence and absence of the specimen for continuous moisture measurement (production process being measured in an on-line manner, col. 4, line 9-10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included Maeno's computerized continuous measurement with peak value comparison in the S-S resonant cavity moisture measurement, for a production process, as suggested by Maeno.

12. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki, Shimizu and Maeno (S-S-M) as applied to claim 12, and further in view of Fitsky.

Regarding claim 13, the teachings of S-S-M are reviewed above.

S-S-M does not include a temperature dependency value storage unit for resonant peak level storage, a temperature sensor, or a correction means that corrects the resonance peak value based on the detected temperature from the sensor.

Fitsky teaches that the effect of temperature is critical to shifting the absorption maximum (col. 3, line 60 – col. 4, line 5), suggesting a measurement and selection of temperature.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included Maeno's computerized continuous measurement with peak value comparison in the S-S resonant cavity moisture measurement, for a production process, including a temperature dependency value storage unit for resonant peak level storage, a temperature sensor, or a correction means that corrects the resonance peak value based on the detected temperature from the sensor, for the benefit of minimizing the effect of temperature, as suggested by Fitsky (col. 3, line 63).

Regarding claim 14, Sasaki includes a guide with a shape for guiding the specimen into the slit and attached to the end portion of the slit side on the outside face of the waveguide, which appears to be the E face of the cavity resonator (12<sub>2</sub>, 13<sub>2</sub>, Fig. 2).

#### ***Allowable Subject Matter***

13. Claims 2-4, 11, 15, 16, and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fitsky (4,270,083; 4,155,035) teaches microwave moisture measuring devices and method.

Art Unit: 2858

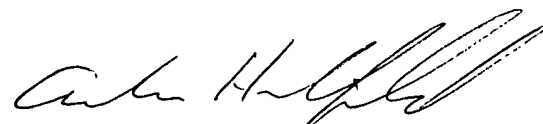
15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas F. Valone whose telephone number is 571-272-8896. The examiner can normally be reached on 10-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Hirshfeld can be reached on 571-272-2168. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*TV*

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